

Robertshaw
Installation
&
Operating Instructions
for

DSL-520P
COMMUNICATING ZONE
THERMOSTAT

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IMPORTANT

READ THIS BOOKLET THOROUGHLY IN ORDER TO UNDERSTAND ALL THE OPERATION FEATURES OF YOUR ENVIRONMENTAL MODULE.

RECORD THE SERIAL NUMBER IN THE SPACE PROVIDED.

SERIAL NUMBER _____

DATE OF INSTALLATION _____

DSL-520P ZONE THERMOSTAT

INTRODUCTION

The nonprogrammable DSL-520P zone thermostat is the exclusive thermostat used with the SlimZone Premier (SZP) system. The system will not function with any other thermostat.

The DSL-520P is a fully communicating thermostat which is powered by the SZP control module and is constantly exchanging data with the control module to optimize control of the zoned environment. It represents the most advanced solid-state, microprocessor temperature control on the market today.

The thermostat has been designed to provide accurate control and display of room temperature, and normally displays room temperature, mode of operation and whether cooling or heating is currently on.

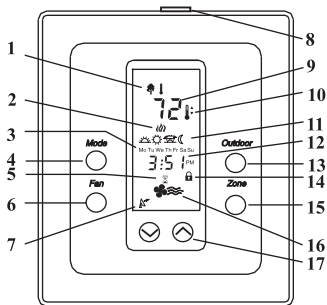
Your new thermostat uses an adaptive control routine, based on Fuzzy logic, to determine the heating or cooling load of the area in which it is installed. The routine calculates the load by evaluating recent room conditions (from the sensor within the thermostat or connected remote sensor) and reactions to heating and cooling. The load factor is then used to determine when your equipment should be activated and for how long, providing optimum control and economy.

The SZP system uses 7 day programmability with 2 or 4 events per day. Programming is done at the SZP control module only. The DSL-520P thermostat provides the ability to temporarily deviate from the established program by simply pressing the ▼ or ▲ buttons to change the temperature setpoints. In addition, you may choose to display the temperature in °F or °C.

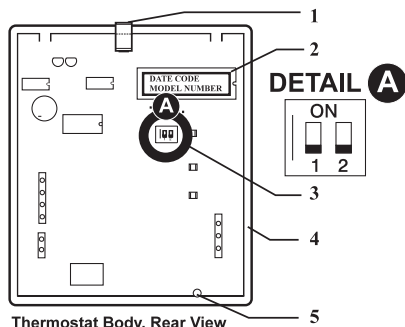
The thermostat also allows you to select constant fan operation (useful when using an air cleaner) or have the fan activated automatically when the heating or cooling equipment is energized.

FEATURES

- * Nonprogrammable (programming is done at the SZP control module)
- * Powered by the SZP control module (no separate transformer required)
- * User friendly keypad providing access to system parameters such as fan control (FAN), mode of operation (MODE), outdoor temperature (OUTDOOR) and zone identification (ZONE)
- * Selectable Celsius or Fahrenheit temperature display
- * Selectable 12 or 24 hour clock display
- * Constant fan or automatic fan operation
- * Internal switch to lock-out the keypad to prevent tampering
- * No batteries required — always remembers the fan setting and mode of operation (all other parameters remembered by SZP control module)
- * 2°F (1°C) minimum heat/cool separation
- * Minimum call time (2 or 4 minute, selectable)
- * Dry contact relay output for perimeter heat with LED indicator
- * Lockable access cover



1. Outdoor Remote Sensor
2. Heating (Flame ) , Cooling (Snowflake )
3. Days of the week
4. **MODE** button (Toggles between Heat, Cool, Auto, Off)
5. Temporary Override
6. **FAN** button (Toggles between Constant or Automatic Fan)
7. Communication Link established
8. Perimeter Heat LED
9. Room Temperature Display
10. Temperature Setpoint change
11. Events (Morning , Day , Evening , Night )
12. Time of day or Mode of Operation
13. **OUTDOOR** button (Displays outdoor temperature)
14. Keypad locked
15. **ZONE** button (Displays zone number of thermostat)
16. Fan
17. **▲ ▼** buttons (Raise or lower setpoint or toggle between °C or °F when pressed simultaneously)



Thermostat Body, Rear View

- | | |
|---|---|
| <p>A DIP Switch in the OFF position</p> <p>1. 4 Minute (Min. ON/OFF)</p> <p>2. Keypad Unlocked</p> | <p>DIP Switch in the ON position</p> <p>1. 2 Minute (Min. ON/OFF)</p> <p>2. Keypad Locked</p> |
|---|---|

*NOTE: The BLACK rectangle denotes factory setting.

1. Perimeter Heat LED
2. Date Code & Model Number
3. DIP Switch
4. Printed circuit board
5. Thermistor: measures room temperature

DSL-520P USER INTERFACE, LED AND SWITCHES

COMMUNICATION

The thermostat and the SZP control module are in constant communication with each other at 1200 baud using a RS485 interface. The satellite dish symbol  will appear in the lower left-hand corner of the display when the units are communicating properly. During communication the uplink symbol () will flash randomly. The satellite dish symbol  disappears if the DSL-520P loses communication with the SZP control module. The thermostat receives the following operating parameters from the control module:

- temperature setpoint values
- morning, day, evening, and night event schedules
- time of day and outdoor temperature value

OPTIONAL FEATURES AND EQUIPMENT

The following are some of the options available for your electronic thermostat to further enhance and expand its capabilities. The following are descriptions only. Refer to the instructions provided with these components for wiring information.

SL-IDS REMOTE INDOOR TEMPERATURE SENSOR

The Robertshaw remote indoor sensor (SL-IDS) is easy to install and provides accurate digital communication of room temperature to the controlling thermostat from up to 300 feet (90m), using 3-wire, 18-24 AWG unshielded copper cable wired directly to the thermostat (RS2, RS1, and RS+V). There are no switches to set. The thermostat detects the remote sensor connection

and RS+V). There are no switches to set. The thermostat detects the remote sensor connection and controls temperature based on the data received.

PERIMETER HEAT

The W1 and R terminals on the DSL-520P are designated for use with perimeter heat, one for each zone. The perimeter heat will be activated when the thermostat requests heat and the SZP control module is not demanding heat from the main heating source.

Terminal	Function
R	24VAC input for perimeter heat
W1	Perimeter heat dry contact output
RS2, RS1 RS+V	Indoor remote sensor connections. Refer to the instructions included with the sensor.
1-4	Communication terminals to the SZP control module. The terminals must be connected 1-1, 2-2, 3-3, 4-4 to function and prevent damage.

DSL-520P OUTPUT TERMINALS, LED DESIGNATIONS

THERMOSTAT INSTALLATION: DSL-520P

LOCATION

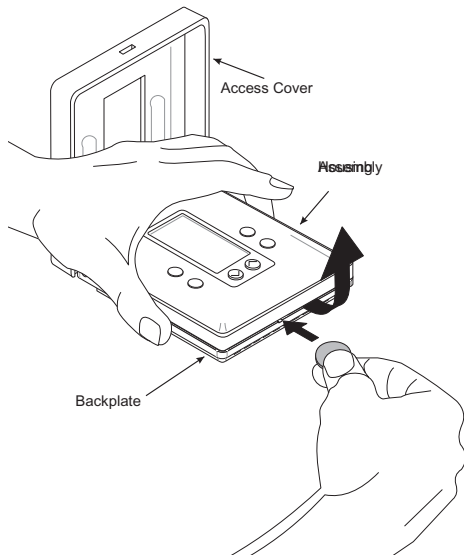
The most important consideration in installing your DSL-520P Communicating Zone thermostat is where to locate the unit. The location can radically affect the operation of the thermostat. To ensure proper operation, the thermostat should be mounted on an inside wall in a frequently occupied area of the zone. In addition, its position must be at least 18 inches (46 cm) from any outside wall, and approximately 5 feet (1.5 m) above the floor in a location with freely circulating air of an average temperature.

BE SURE TO AVOID THE FOLLOWING LOCATIONS:

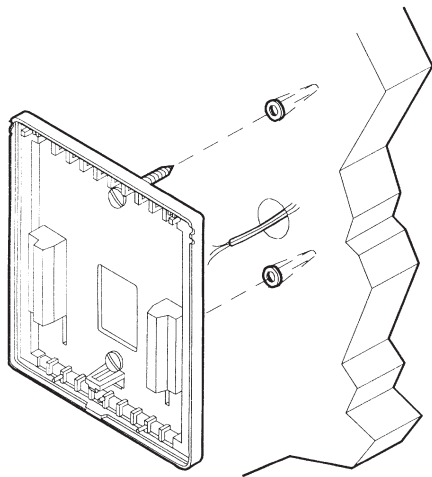
- * behind doors or in corners where freely circulating air is unavailable
- * where direct sunlight or radiant heat from appliances might affect control operation
- * on an outside wall
- * adjacent to, or in line with, conditioned air discharge grilles, stairwells, or outside doors
- * where its operation may be affected by steam or water pipes or warm air stacks in an adjacent partition space, or by an area not heated or cooled behind the thermostat
- * where its operation will be affected by the supply air of an adjacent unit
- * near sources of electrical interference such as arcing relay contacts

INSTALLATION

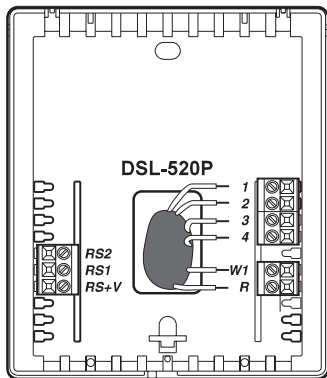
1. Lift the thermostat access cover and insert a coin or large flat blade screwdriver into the slot located in the bottom center of the case and twist 1/4 turn (be extremely careful not to insert more than 1/8" [3 mm] into the casing, as this may damage the circuit board). Grasp the lower corners of the thermostat body and separate from the thermostat backplate. Swing the thermostat out from the bottom, and lift up and out of the base.
2. Place the rectangular opening on the thermostat backplate over the equipment control wires protruding from the wall. Using the base as a template, mark the location of the two (2) mounting holes. No leveling is required.
3. Use the supplied anchors and screws for mounting on the drywall or plaster. Drill two (2) 3/16" (5 mm) holes at the marked locations and tap nylon anchors flush to the wall surface. Fasten the backplate to the wall.
4. Connect the control module wires to the thermostat terminal blocks. Connect the low voltage wires from the perimeter heat device if installed.
5. Push any extra or slack wire back into the wall. Dress the remaining wires so they are flush to the mounting plate. The access hole should be sealed or stuffed to prevent drafts from the wall affecting the thermostat.



SEPARATING THERMOSTAT AND BACKPLATE



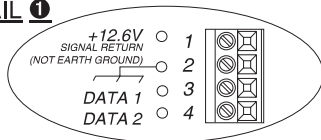
ATTACHING BACKPLATE TO THE WALL



NOTE: IN MOST APPLICATIONS
SHIELDED WIRE IS NOT REQUIRED

DSL-520P ZONE CONNECTIONS

DETAIL ①

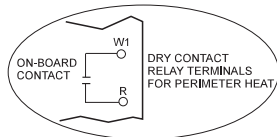


WARNING:

**MUST MAINTAIN CORRECT
POLARITY BETWEEN
THERMOSTATS AND PANEL,
OTHERWISE COMMUNICATION
WILL NOT BE POSSIBLE AND
DAMAGE WILL OCCUR!**

1----->1
2----->2
3----->3
4----->4

DETAIL ②



REASSEMBLING THE THERMOSTAT TO THE INSTALLED BACKPLATE

Before the thermostat is reassembled to the backplate, ensure the following:

- * Polarity has been respected for the communication wires.
- * All wires for peripheral components (SL-IDS, perimeter heat) are connected.
- * Ensure all wires are properly inserted and screwed down in terminal blocks.
- * Ensure dipswitches are set appropriately

Reassemble the thermostat as follows:

1. Position the housing assembly inside the access panel.
2. Position the housing and access panel assembly on the hinged tabs located at the top of the installed backplate.
3. Gently swing the thermostat and access cover downwards and press on the bottom center edge until it snaps into place.

NOTE: TEMPERATURE ACCURACY

Full temperature accuracy will only be realized after the thermostat has been installed and powered for at least one (1) hour.

THERMOSTAT VERIFICATION

The thermostat operation may be verified only when the SZP control module is powered; the control module provides power to the zone thermostats. Verify operation as follows:

1. Check that the satellite dish symbol appears at the lower left corner of the display and that the uplink symbol ↖ flashes occasionally. If the symbols are present, the thermostat and the SZP control module are communicating properly. If the symbols are not present, the thermostat and the module are not communicating. **If ↖ is not present, check communication wiring and ensure that polarity is correct.**
2. Press the MODE button to select either the heat 🔥 or cool ❄ mode. The flame and snowflake symbols start flashing only when SZP finally brings on the equipment.
3. Press the ▲ button to raise the temperature setpoint above (in heat mode), or the ▼ button to lower the temperature setpoint below (in cool mode), the current displayed temperature. Within a few seconds, the thermostat should call for either heating or cooling. Check at the SZP control module that the orange LED (heating) or the yellow LED (cooling) for this zone's input is ON, indicating that the control module has acknowledged the call. Note that the equipment might not be activated depending on the setup and status of the control module.

4. Return the temperature setpoint to its original value. Note that selecting the OFF mode clears the  symbol, ending the temporary override.
5. Press the FAN button until the fan symbol () appears; the green LED (fan) will light up at the SZP control module.
6. Press the FAN button again if constant fan is not required.

DAMPERS

Robertshaw dampers are designed to work with low pressure systems (1.0" WC or less). Balancing dampers should be installed ahead of all zone dampers. Zone dampers should be installed 10 ft. (3 m) back from discharge grille. A flex or lined duct is recommended for the last 5 ft. (1.5 m). Enerstat dampers are two (2) position dampers. Two (2) wire dampers are powered closed and spring return open. Three (3) wire dampers are powered closed and powered open. For applications requiring minimum air ventilation, an adjustment screw is available to set the damper to a specified minimum open position. Enerstat dampers are shipped from the factory with the minimum position adjustment screw in the fully closed position; allow for a 3% to 5% leakage with damper closed. The control module has five (5) terminals at each zone terminal strip for damper connections, which are as follows:

24L:	24VAC transformer
24N:	24VAC transformer common
PC:	power damper closed
24N:	common
PO:	power damper opened

Power to the dampers is provided by the 24L and 24N terminals at each zone terminal strip. Refer to section 3.4 of the SZP manual for information on sizing transformers.

WIRING INFORMATION

Use #18AWG (nonshielded) copper wire for all system wiring; thermostats may use 18-24 AWG wire. Thermostats and damper actuators may be located up to 300 ft. (90m) from the control module. All system wires should be tagged to identify thermostat, damper and equipment wiring. Refer to section 4.2 of the SZP manual for the control module wiring diagram. It is strongly recommended that a spare or third wire be run between the control module and each zone damper in the event that a three (3) wire damper actuator is used or required in the future.

CURRENT LIMITED OUTPUT TERMINALS

All output circuits on the SlimZone Premier control module incorporate self-resetting current

limiting devices which provide protection against excessive current draws caused by circumstances such as wiring shorts on an output. These devices, referred to as polyfuses, are activated in general when the current draw exceeds 2.5 Amps. The value and the duration of the excess current is taken into account. The polyfuses will allow excess currents of very short duration (i.e., spikes) in order to prevent circuit interruptions by noisy lines or occasional minor surges. In its current limiting mode, the polyfuses reduce the output current to milliamps.

NOTE:

The low leakage current may be sufficient to produce a small voltage reading when measured with a volt meter with a high input impedance.

When the cause of the excess current has been removed and the current draw is returned to a value below 2.5Amps, the polyfuses will reestablish full output current; in some instances this may take up to twenty (20) seconds. Polyfuses eliminate the need to replace blown fuses.

The SZP control module uses red LEDs to indicate when a problem exists with the current being drawn from certain circuits. An LED exists for the following on-board circuits:

- * each zone damper circuit
- * each zone thermostat circuit (current limited at 0.1Amp)
- * on the cool terminal strip
- * on the heat terminal strip

SETTING YOUR THERMOSTAT

MODE Button

This button allows selection between the four (4) modes available: OFF, COOL ❄, HEAT 🔥, AUTO ❄ 🔥. The words (accompanied by their appropriate symbols) HEAT, COOL, and AUTO are displayed for five seconds. The word OFF remains visible. To set the desired mode of operation, do the following:

1. Press and release **MODE** button until the word **HEAT** is momentarily displayed; the 🔥 symbol remains to remind you that the thermostat is in heat mode. The thermostat will activate the heating system only, based on the **HEAT** temperature setpoint.
2. Press and release **MODE** button until the word **COOL** is momentarily displayed; the ❄ symbol remains to remind you that the thermostat is in cool mode. The thermostat will activate the cooling system only, based on the **COOL** temperature setpoint.
3. Press and release **MODE** button until the word **AUTO** is momentarily displayed; the ❄ 🔥 symbols remain to remind you that the thermostat is in auto changeover mode. The thermostat will activate the heating or cooling equipment, based on the previously established temperature setpoints for both modes.
4. Press and release **MODE** button until the word **OFF** is displayed; **OFF** remains to remind you that the thermostat is in off mode. In the off mode, the thermostat displays the room temperature and ignores the temperature setpoints; the thermostat will not make any calls for equipment.
5. Press and release the **MODE** button until you have selected the desired mode of operation.

FAN Button

This button allows selection between constant fan or auto fan mode. The constant fan mode continuously displays the  symbol; auto fan mode means that the fan only activates when heating or cooling equipment has been activated; the  symbol does not appear when the fan is activated during a call for cooling or heating.

1. Press and release the **FAN** button until the desired fan mode has been selected.
2. Constant fan mode is recommended for electronic air cleaners and constant ventilation requirements.

OUTDOOR Button

This button allows the thermostat to display the outdoor temperature, if the SlimZone Environmental Module (SZEM) has been installed with an optional outdoor remote temperature sensor. (Refer to section 4.6 for ZSEM module information.)

1. Press **OUTDOOR** button; the  icon is displayed, along with the outdoor temperature just below. If there is no remote sensor connected the temperature display will show - -.
2. Release the **OUTDOOR** button; the thermostat will again display the indoor temperature.

ZONE Button

Pressing the **ZONE** button displays the zone number where the thermostat is located and indicates to which input it is connected to on the SZP control module.

Changing the Temperature Setpoints

Change the temperature setpoints by pressing the ▼ or ▲ buttons to lower or raise the displayed setpoint. Pressing the buttons once will display only the current setpoints that the thermostat is controlling. Press and hold to change the value.

To access a setpoint, the thermostat must be in a mode of operation where the setpoint would be used (e.g., to change the heat setpoint, the thermostat must be in either the heat or auto mode). The mode symbol for the setpoint being displayed (◊ for heat and ✱ for cool) will also appear. When in the auto mode, the thermostat will first display either of the two setpoints, heat or cool. To view or change the opposite setpoint, press the MODE button.

°C or °F

Press the ▼ and ▲ buttons simultaneously to change the displayed temperature from Celsius (°C) to Fahrenheit (°F), and vice versa.

12 or 24 Hour Clock

Press and hold the FAN button, then press the OUTDOOR button to change the time of day display to 12 or 24 hour format.

Local Temporary Override

OCCUPIED PERIOD

When in either the morning, day or evening program, the temperature setpoints may be changed at the zone thermostats by simply pressing the ▼ or ▲ buttons. The selected setpoints remain valid for the duration of the occupied period. When the unit changes over to the unoccupied period, the override setpoints are discarded and the thermostat reverts to the setpoints established by the SZP control module for the night program.

UNOCCUPIED PERIOD

System: Unoccupied mode occurs when **all** zone thermostats are in night mode.

Local: Unoccupied mode occurs when a zone thermostat goes into night mode.

The minimum temporary override is one (1) hour and will remain in effect until the one (1) hour period has elapsed. Moving into an unoccupied period (night mode) during this minimum temporary override will not affect its status.

During the unoccupied period, zones 1-13 act as MUST SERVICE zones when the zone thermostat ▼ or ▲ buttons (system override) are depressed. Zones 14-19 do not act as MUST SERVICE zones at this time.

Keypad Lockout

With the keypad locked out (DIP switch #2 in the ON position) the MODE, FAN, and ▼ and ▲ buttons are disabled; the lock symbol  appears when these buttons are pressed. The OUTDOOR and ZONE buttons still function.

WARRANTY

LIMITED TWO YEAR WARRANTY

The manufacturer warrants to the original purchaser that its product and component parts will be free from defects in workmanship and materials for a period of two years from the date of purchase. Your dealer will provide free replacement of your thermostat upon proof of purchase.

EXCLUSIONS

This warranty does not apply in the event of misuse, abuse, or as a result of unauthorized alterations or repairs. The manufacturer will not be liable for any consequential damages including, without limitation, damages resulting from defects, loss of use or misuse.

This equipment, if installed in strict accordance with the manufacturer's instructions, complies with the limits for a class B computing device pursuant to Subpart J of Part 15 of FCC rules.

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